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## The Newman Procedure for Analyzing Primary Four Pupils Errors on Written Mathematical Tasks: A Malaysian Perspective

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### Abstract

The change in PPSMI's language of learning and teaching of Mathematics to English had been opined to have prejudiced learners' achievements due to their weakness in the subject matter as well as in English. This study was conducted to ascertain the validity of such claims and it sought to determine the composition of error types committed by 22, purposively sampled, Primary Four pupils in Mathematics tasks presented in English. Semi-structured interviews were conducted using the Newman's Error Analysis protocol with these pupils who answered inaccurately in several of the test's items. It was found that, collectively (both urban and rural), the Primary 4 pupils' errors were language related and the rest 68% were content-knowledge related. This study concluded that the pupils faced more problem in content-knowledge compared to language difficulties when tackling mathematical tasks in English.

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**Keywords:** Newman error analysis; Mathematical errors; Language; Word problems

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### 1. Background

In 2002, the government of Malaysia announced that the subjects of Mathematics and Science at both the primary and secondary levels were to be taught in English. This policy, better known by its acronym PPSMI or the Teaching and Learning of Science and Mathematics in English, was deemed necessary as it would enable learners to access information using the multimedia means to gather knowledge in the dynamic fields of Mathematics and Science using English, a language in which the two subjects' current and latest knowledge is available. Learners inculcated under this policy shall assist in the country's aspiration to become a developed nation by the year 2020 come to its fruition. A desirable backwash of this policy is the emergence of a new generation of learners who are competent and conversant in the English language. Various measures by the Education Ministry such as grants, training, teaching paraphernalia, aids and software, and monetary assistance was undertaken to enhance this policy.

Despite these measures, various researchers (Isahak, Abdul Latif, Md Nasir, Abdul Halim & Mariam, 2008; Nor Hashimah, 2003) found weakness in the use of English as the medium of instruction which they claimed had hindered learners' progress and achievements in the two subjects as well as weakening the learners' interest in them. The language has been blamed for hindering learners from benefitting from the policy. Learners' low proficiency in the language formed a barrier for them to elevate, theoretically and practically, their knowledge and skills in the two subjects (Johari, Nor Hasniza & Meor Ibrahim, 2006; Isahak et al., 2008). After much consideration on these circumstances, the Education Minister in July 2009 announced the reversal of ETeMS to Bahasa Malaysia for all national schools including the Chinese and Tamil vernacular schools with effect from 2012 (The Star, 9 July, 2009). In the same press statement, the Minister pointed out that 'the reversal in policy was not a knee-jerk decision as it was based on empirical studies and other specialist reviews which confirmed that the desired objectives have not been met.'

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English language has been held responsible for holding the learners back from performing their true potentials in the said subjects (Johari et al., 2006; Isahak et al., 2008). With regards to Mathematics, which is the main concern of this study, caution should be exercised when accusing language as being the sole factor for learners' failure to produce correct answers to written tasks. Parmjit (2004) has identified that mathematical acumen was also necessary beside knowledge of language in order to satisfactorily arrive at the solutions for mathematical tasks. Similarly, Newman (1977) also postulated that both language and mathematical acumen are necessary for the successful solution of mathematical exercises. Furthermore, Lerman (2001), cited in Parvanehnezhad and Clarkson (2008), wrote of 'strategies', which are mathematical content knowledge that learners need to bring with them to a mathematical task together with the ability to interpret and comprehend mathematical jargons and semantics in order to successfully comprehend and solve Mathematics problems.

This study was carried out:

1. to determine whether learners' inaccurate answers in test items written in English are brought about by a weakness in the language or are due to the learners' weakness in Mathematics content-knowledge.
2. to assess the percentage of errors (language-related and content-knowledge related) made in the English Test according to the Newman's Error Analysis by Primary Four pupils.

## 2. Methodology

Prior to choosing of the 22 subjects, ages 10 – 11 years old, who were to take part in this study, 186 Primary Four pupils from intact classes from five schools in a district in Pahang were administered with a Mathematics achievement test which items were presented in the English language (henceforth the English Test). The said achievement test consisted of 20 written mathematical tasks compiled in English. These questions were adapted from Parmjit (2006) based on the Year 4 Mathematics Curriculum Specification. The word problem items in the test include the four basic operations, namely addition, subtraction, multiplication and division as the fundamental requirement of elementary Mathematics for primary pupils. This study called for the interviewing of 22 subjects (P1 to P11 are rural school Primary 4 pupils, P12 to P22 are urban school Primary 4 pupils), who were purposively sampled based on them making inaccurate answers to test items in the English Test, using the procedures outlined for Newman's Error analysis interview (Newman, 1977). The procedure utilized a face to face interaction between the researcher and a subject. The pupil was given a fresh set of the English-only instrument and the researcher referred him/her to a particular item that the subject had answered wrongly in the earlier test. The next step in the Newman's Error analysis required that the researcher ask the subjects to provide responses to questions and perform several tasks.

Newman (1977) described of the five consecutive steps (hierarchy) a person needs to go through in attempting to answer a written mathematical task. These steps are as shown in Figure 1. Prakitipong & Nakamura (2006) proclaimed that the success in the initial two steps (Reading and Comprehension) signifies that the learner has interpreted the question in the mathematical context correctly. The completion of the final three steps (Transformation, Process Skill and Encoding) signifies that the learner has successfully executed the mathematical processes required in order to solve the task. As such, the use of Newman's Error Analysis interview, utilized by White (2005), Prakitipong & Nakamura (2006) and Gordo-Imson (n.d) to determine learners' causes of errors in attempting mathematical task, is deemed appropriate to find out whether the roots of learners' difficulties in this study stem from language or content-knowledge causes.

|            |                  |                   |                  |             |
|------------|------------------|-------------------|------------------|-------------|
| 1. Reading | 2. Comprehension | 3. Transformation | 4. Process Skill | 5. Encoding |
|------------|------------------|-------------------|------------------|-------------|

Figure 1: Newman's Hierarchy of Mathematical Task Execution

## 3. Findings

### 3.1 Qualitative Findings

The interviews were conducted using both English and Bahasa Malaysia, favouring the language a particular subject was more comfortable with. These interviews were recorded and transcribed.

#### 3.1.1 Types of Error Detected during the Interviews

This section provides examples of errors that were detected during the semi-structured interviews. English translation is provided in the parentheses. These examples contain the pupils';

- i) verbalized pronunciation and/or grammatical mistakes, and
- ii) physical gestures

that the researchers attempt to preserve in the transcriptions. These appear in the box parentheses. Newman (1977) listed five types of errors that may be detected through the Newman's Error Analysis interviews. These are:

### i) Reading Error

A reading error occurred when written words or symbols failed to be recognized by the subject that led to his/her failure to pursue the course of problem-solution. An example of this type of error is shown below.

*Item 1. 2l of coconut juice is poured equally into 8 glasses. How many milliliters of coconut juice are there in each glass?*

Example: (I – Interviewer, P9 – Pupil Number 9)

I: Tengok soalan nombor 1. P9 boleh tolong bacakan soalan ni? (*Look at question number 1. P9, can you please read the question?*)

P9: [shook his head]

I: Jangan geleng je, cubalah. (*Don't just shake your head, please try*)

P9: Tak boleh (*Cannot do*)

I: Tak pandai baca? Tak pandai membaca ya? Cuba tengok soalan nombor 2, boleh baca soalan nombor 2? (*Can't read? You cannot read, can you? Can we have a look at question number 2, can you read question number 2?*)

P9: ...

Despite being asked repeatedly by the interviewer, P9 could not read out the questions. This showed that the pupil faced reading problem as put forward by the Newman Error Analysis.

### ii) Comprehension Error

A comprehension error occurred when the pupil was able to read the question but failed to understand its requirement, thus causing him/her to err in or to fail at attempting problem-solution. An example of this type of error is shown below.

*Item 2. Chin buys a bag that costs RM29.30. The shopkeeper returns RM70.70 as change to her. How much money does Chin give to the shopkeeper earlier?*

Example: (I – Interviewer, P6 – Pupil Number 6)

I: ... let's look at question number 2 now. OK macam tadi juga cuba baca kuat-kuat soalan tu. (*OK, like just now, read the question loudly*)

P6: Chin [buy] a bag that cost RM twenty [twenty] nine Ringgit thirty sen. The shop shopper, [shop shopkeeper] [return] RM70.70 as change to her. How much money does Chin give to the shopkeeper [erlai]?

I: OK very good. Soalan ni dia suruh P6 cari apa? Apa dia cakap soalan ni, dia suruh cari apa? (*What does the question ask you to find? What does the question say? What does it want you to find?*)

P6: Tak tau jugalah, tak ingat dah. (*Don't know as well, I can't recall*)

I: Ni soalan dia, tak ingat dah? Agaknya soalan tu suruh cari apa? Tak tahu? (*This is the question here, can you recall now? What do you think the question ask you to find? Do you know?*)

P6: [Shook his head]

In this example, although the pupil had managed to read out the question loudly, P6 could not tell the researcher the question's requirement. This denoted an error of comprehension according to Newman's Error Analysis.

### iii) Transformation Error

A transformation error occurred when the pupil had correctly comprehended a question's requirement but failed to identify the proper mathematical operation or sequence of operation to successfully pursue the course of problem-solution. An example of this type of error is shown below.

*Item 7. A bag weighs 2.88 kg. A basket weighs 320g less than the bag. Calculate the total weight of both the bag and the basket.*

I: ... Look at question number 7. Can you read the question loudly for me, please?

P4: A bag [weight] 2.88 kg. A basket [weight] 320 gram less than the bag. Calculate the total weight of both the bag and the basket.

I: What does the question ask you to look for?

P4: Calculate the total weight.

I: Which operation would you use? Macam mana P4 nak buat? (*How are you going to solve the problem?*)

P4: Darab. (*Multiply*)

P4 was able to read and comprehend the given task. However, he found difficulty in the transformation process when the mathematical operations needed were actually subtraction followed by addition.

### iv) Process Skill Error

A process skill error occurred when, although the correct operation (or sequence of operations) to be used to pursue problem-solution had been identified, the pupil failed to carry out the procedure correctly.

Item 19. A clerk typed several letters and arranged some files in 4 hours and 15 minutes. If he spent 2 hours and 30 minutes typing the letters, how much time did he spend arranging the file?

Example: (I – Interviewer, P14 – Pupil Number 14)

I: ... Kita tengok soalan nombor 19. (*Can we have a look at question 19*) Can you read the question loudly for me?

P14: A clerk typed several [letter] and arrange some files in 4 hour and 15 minutes. If he spent 2 hour and 30 minute typing the letter, how much time did he spend arranging the files?

I: Soalan ni dia nak suruh P14 cari apa? (*What does this question ask P14 to find?*)

P14: Suruh berapa banyak dia guna untuk susun fail. (*(It) asks me to how much he used to arrange the files.*)

I: Berapa banyak, apa? (*How much what?*)

P14: Masa (*Time*)

I: Masa. OK. Apa kaedah Matematik yang P14 akan gunakan untuk selesaikan masalah ini? (*Time. OK. Which mathematical method would P14 use to solve this problem?*)

P14: Tolak (*Subtraction*)

I: Tolak, OK cuba tolong selesaikan. (*Subtraction. OK. Please solve the problem.*)

P14: 4 hour and 15 minutes minus 2 hour and 30 minutes. ... One hour and eighty-five minutes

In this example, although P14 had been able to read and comprehend the question and correctly identified the necessary mathematical operations to be used, she made a procedure error in her calculation. The final answer should have been one hour and forty-five minutes. The following provides the explanation for her error.

*P14's calculation:*

$$\begin{array}{r} 4\text{hr } 15\text{min} \\ - 2\text{hr } 30\text{min} \\ \hline 1\text{hr } 85\text{min} \end{array}$$

*Explanation*

*P14's error stemmed from her borrowing as 100 when it should have been 60 as one hour is equal to 60 minutes.*

#### v) Encoding Error

An encoding error occurred when, despite having appropriately and correctly solved a mathematical task, the pupil failed to provide an acceptable written form of the answer. An example of this type of error is shown below.

Item 12. Calculate the volume of the cuboid.

I: ... Question number 12, then. OK can you read the question loudly, please?

P20: Calculate the volume of the cuboid.

I: OK. What does the question want you to find?

P20: Volume of the cuboid.

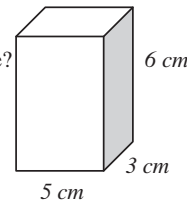
I: To look for the volume of the cuboid. OK How to do it?

P20: Multiply.

I: Multiply. Can you do it for me here?

P20: 6cm times 3 cm times 5 cm. ... 90 cm

I: OK itu jawabannya ya? (*OK. Is that the answer?*) Thank you, that's good.



In this case, P20 had correctly gone through the whole process to obtain the correct answer to the question. However, she failed to write the proper and acceptable form of the answer when she wrote 90cm as her answer when the appropriate one was 90 cm<sup>3</sup>.

White (2005) highlighted another kind of mistake that surfaced during the interviews: carelessness.

#### vi) Carelessness

This type of error was detected when during the interview the pupil managed to obtain the correct answer despite having gotten the solution wrong when he/she tackled the same task during the real test.

Item 7. A bag weighs 2.88 kg. A basket weighs 320g less than the bag. Calculate the total weight of both the bag and the basket.

I: ... Can we have a look at question number 7? Can you read the question for me, please?

P20: A bag weighs 2.88 kg, a basket [weigh] three two zero gram less than the bag. Calculate the weight of both the bag and the basket.

I: OK. Soalan tu dia suruh cari apa? (*OK. What does the question want you to find?*)

P20: Total weight and basket weight

I: Total weight and basket weight. Ok macam mana nak cari tu? (*OK. How do you do that?*)

P20: Tolak, tambah (*Subtract, add*)

I: Tolak, tambah. (*Subtract, add.*) OK very good. Can you do it here?  
 P20: Convert kg to gram, ... 2880 minus 320, 2560. 2560 plus 2880. 5440  
 I: OK. And can you write down the answer? Thank you very much.

Initially P20 gave 11440g as her answer when she first attempted the English Test which was a process-skill error. During the interview however, she had managed to obtain the correct answer of 5440g that led her error to be classified as stemming from carelessness.

Clements & Ellerton (1996) contributed to the description of another type of error: faulty reasoning (or flawed argument).

#### vii) *Flawed Argument*

This occurred when the pupil got the answer to a mathematical task correct despite having misinterpreted the question's requirement and/or committed errors during his/her problem-solving process. For the purpose of this study, the assumptions made by Prakitipong & Nakamura (2006) were followed:

*"...that in the process of problem solving there are two kinds of obstacles that hinder students from arriving at correct answers: (1) Problems in linguistic fluency and conceptual understanding that correspond with level of simple reading and understanding meaning of problems, and (2) Problems in mathematical processing that consist of transformation, process skills, and encoding answers."*

(Prakitipong & Nakamura, 2006, p.113)

With regards to Carelessness and Flawed Argument, since they did not invoke difficulties with regards to language, these errors are grouped together with those that brought about problems in mathematical processing. An example of this type of error is shown below.

*Item 5. The perimeter of a square board is 160 cm. What is the length of each side of the board?*

I: ... Let us look at number 5. Can you read the question for me?  
 P22: The perimeter of a square board is one hundred and sixty cm. What is the length of each side of the board?  
 I: OK soalan tu dia suruh cari apa? (*OK. What does the question want you to find?*)  
 P22: Dia suruh cari berapakah panjang perimeter kalau ditambahkan semua jadi 160 cm. (*It asks me to find what the length of the perimeter is if all is added up to 160 cm.*)  
 I: OK very good, macam mana nak selesaikan? (*... how to solve it?*)  
 P22: Tambah (*Addition*)  
 I: OK cuba buat. (*OK. Try to do it.*)  
 P22: 40  
 I: 40 tu apa? (*What is 40?*)  
 P22: 40 ada 4, dapat jawapan. (*There are four 40s, that's the answer.*)  
 I: OK. Kalau yang ni 180 macam mana nak buat? (*OK. If this is 180 [indicated that the question now read as "The perimeter of a square board is 180 cm..."] how do you solve that?*)  
 P22: ...  
 I: Macam mana nak cari satu sisi? ... OK apa kaedah nak pakai kalau ini 180? (*How to find the length of one side of the board? ... OK what operation would you use if the question says 180?*)  
 P22: Bahagi (*Division*)  
 I: Bahagi. OK cuba buat kat sini. 180 nak bahagi dengan apa? (*Division. OK, try to do it here. What do you divide 180 with?*)  
 P22: 180 bahagi dengan ... 2 (*180 divides by ... 2*)  
 I: Dua tu apa? (*What is that 2?*)  
 P22: Dua sisi (*Two sides*)  
 I: Dua sisi, OK ... tulis jawapan kat sini (*Two sides, OK ... write the answer here.*)  
 P22: Tambah? (*Add?*)  
 I: Bukan, jawapan dia. Jawapan dia 90? OK. (*No, the answer. The answer is 90? OK*)

The researchers had reservations with regards to the method in which the answer 40 was obtained. Therefore, by substituting the value of the parameter, he had been able to determine that the pupil had originally arrived at the correct answer via flawed argument. In this case P22 stated that a division by 2 (that he described as the number of sides) was necessary in order to find the length of each side of a square. The actual number of sides to a square equals to 4.

### 3.2 *Analysis of Qualitative Findings*

A total of one hundred inaccurately answered items were examined during interviews with the 22 pupils (eleven from each rural and urban area). Table 1 shows the number and types of error (identified via the Newman Error Analysis Interviews) committed

by them. There are five types of errors that can be identified from the said interviews. These are errors in reading, comprehension, transformation, process skill, and encoding. In addition to these, errors brought about by carelessness during the pupils' original attempts at answering the items, were also identified. Correct answers but brought about by flawed arguments were also present during the interviews.

Out of the total 100 errors found, two (or 2%) were reading errors, 30 (30%) were comprehension errors and 23 (23%) were transformation errors. Errors of process-skill were committed 15 times (15%), while encoding errors totaled to 8 (8%). Under the category of carelessness, 20 mistakes were committed (20%) and there were two (2%) instances of flawed argument.

Table 1 Number and Types of Error Identified via the Newman's Error Analysis Interviews (*Number of errors =100*)

| Pupil     | Reading | Comprehension | Transformation | Process Skill | Encoding | Carelessness | Flawed Argument | Total |
|-----------|---------|---------------|----------------|---------------|----------|--------------|-----------------|-------|
| P1        | 0       | 2             | 0              | 1             | 0        | 2            | 0               | 5     |
| P2        | 0       | 2             | 2              | 0             | 1        | 0            | 0               | 5     |
| P3        | 0       | 1             | 1              | 2             | 1        | 0            | 0               | 5     |
| P4        | 0       | 0             | 4              | 0             | 0        | 1            | 0               | 5     |
| P5        | 0       | 0             | 0              | 1             | 0        | 3            | 0               | 4     |
| P6        | 0       | 3             | 1              | 0             | 0        | 0            | 0               | 4     |
| P7        | 0       | 2             | 1              | 0             | 0        | 0            | 0               | 3     |
| P8        | 0       | 1             | 2              | 1             | 0        | 0            | 0               | 4     |
| P9        | 2       | 0             | 0              | 0             | 0        | 0            | 0               | 2     |
| P10       | 0       | 5             | 0              | 0             | 0        | 0            | 0               | 5     |
| P11       | 0       | 1             | 3              | 1             | 0        | 0            | 0               | 5     |
| P12       | 0       | 0             | 0              | 2             | 1        | 2            | 1               | 6     |
| P13       | 0       | 4             | 0              | 0             | 1        | 0            | 0               | 5     |
| P14       | 0       | 0             | 0              | 2             | 0        | 2            | 0               | 4     |
| P15       | 0       | 2             | 0              | 1             | 0        | 2            | 0               | 5     |
| P16       | 0       | 0             | 3              | 0             | 1        | 0            | 0               | 4     |
| P17       | 0       | 0             | 2              | 0             | 1        | 2            | 0               | 5     |
| P18       | 0       | 0             | 1              | 2             | 1        | 0            | 0               | 4     |
| P19       | 0       | 4             | 1              | 0             | 0        | 0            | 0               | 5     |
| P20       | 0       | 1             | 0              | 1             | 1        | 2            | 0               | 5     |
| P21       | 0       | 1             | 2              | 0             | 0        | 2            | 0               | 5     |
| P22       | 0       | 1             | 0              | 1             | 0        | 2            | 1               | 5     |
| Frequency | 2       | 30            | 23             | 15            | 8        | 20           | 2               | 100   |

### 3.2.1 Analyses of Errors Committed by Rural School Pupils

A total of 47 items were analyzed with these pupils. Table 2 provides a summary of the findings. It was determined that errors stemming from language (Reading and Comprehension) total to 40.43%, while those that originate from content knowledge (Transformation, Process Skill, Encoding, Carelessness and Flawed Arguments) amount to 59.57%, of the total errors committed by this group of pupils.

Table 2 Errors committed by Rural Schools' Pupils (*Number of items = 47*)

| Types of Error   | Number of Error | Percent |
|------------------|-----------------|---------|
| Reading          | 2               | 4.26    |
| Comprehension    | 17              | 36.17   |
| Transformation   | 14              | 29.79   |
| Process Skill    | 6               | 12.77   |
| Encoding         | 2               | 4.26    |
| Carelessness     | 6               | 12.77   |
| Flawed Arguments | 0               | 0.00    |



### 3.2.2 Analyses of Errors Committed by Urban School Pupils

A total of 53 items were analyzed with these pupils. Table 3 provides a summary of the findings. This group of pupils' errors originating from language factors (Reading and Comprehension) amount to 24.53%. Content knowledge-caused mistakes (Transformation, Process Skill, Encoding, Carelessness and Flawed Arguments) make up 75.47% of the total errors.

Table 3 Errors committed by Urban Schools' Pupils (Number of items = 53)

| Types of Error   | Number of Error | Percent |
|------------------|-----------------|---------|
| Reading          | 0               | 0.00    |
| Comprehension    | 13              | 24.53   |
| Transformation   | 9               | 16.98   |
| Process Skill    | 9               | 16.98   |
| Encoding         | 6               | 11.32   |
| Carelessness     | 14              | 26.42   |
| Flawed Arguments | 2               | 3.77    |

### 3.2.3 Analyses of Errors Committed by Rural and Urban Pupils

100 items were analyzed. Table 4 provides a summary of the findings. Errors stemming from language factors (Reading and Comprehension) total to 32% among both rural and urban school pupils while the rest 68% of errors originate from content knowledge (Transformation, Process Skill, Encoding, Carelessness and Flawed Arguments).

Table 4 Errors committed by Rural and Urban Schools' Pupils (Number of items = 100)

| Types of Error   | Number of Error | Percent |
|------------------|-----------------|---------|
| Reading          | 2               | 2.00    |
| Comprehension    | 30              | 30.00   |
| Transformation   | 23              | 23.00   |
| Process Skill    | 15              | 15.00   |
| Encoding         | 8               | 8.00    |
| Carelessness     | 20              | 20.00   |
| Flawed Arguments | 2               | 2.00    |

## 4. Discussion and Conclusion

With regards of rural area pupils, this study identified that 40.43% and 59.57% of their errors in the English Test happened due to language factor (Reading and Comprehension) and content-knowledge factor (Transformation, Process Skill, Encoding, Carelessness and Flawed Argument) respectively. These were quite close to Newman's (1977), in Clements and Ellerton (1996), findings that thirty-five percent of all errors made by low-achieving students happened in Reading and Comprehension categories while the rest of the errors were content-knowledge in nature. Newman also found that a high percentage of errors, amounting to twelve percent, were made at the Transformation stage where the pupils were required to transform their understanding of the written tasks into Mathematics. Incidentally, such incidence was quite high for the rural pupils as well. It was here at the transition point interconnecting language and Mathematics that the pupils falter, committing up to 29.79% of all errors. For this group of pupils, while the percentage of their errors caused by the language factor was high, they were also handicapped by their deficient content-knowledge of Mathematics. As such, the English language cannot solely be blamed for this group's low achievement in the English Test; equally responsible for their dismal performance was their weakness in the Mathematics subject itself.

The results for their urban counterparts meanwhile, showed that only 24.53% of their errors stemmed from language factors while the rest 75.47% were due to content-knowledge. Here is then evidence foregrounding the culprit that brought down the pupils' performance in the English Test – their mathematical acumen that is still in the early stages of development. For this group of pupils then, it seems that language offers but a small barrier to them in tackling Mathematics tasks in English, what they need to improve on is their knowledge and mastery of Mathematics as a subject itself.

Collectively the data for the rural and urban pupils showed a closer resemblance to Newman's (1977), Clements (1980), Watson (1980) and Clarkson (1983), cited in Clements and Ellerton (1996), which showed about fifty percent of errors occurring at the initial three steps of the Newman's Hierarchy of Error Causes (Clements and Ellerton, 1996). 34% of their errors happened at the Reading and Comprehension stages, while 21% happened during the Transformation stage. With regards to the language – content knowledge dichotomy, both the rural and urban pupils committed 34% errors that were language in nature and 66%

errors that were content-knowledge related. In keeping with the comments with regard to the relationship of English and Mathematics achievements made above, it has to be reiterated here that the English language does not seem to be the main culprit in causing abysmal learners' performance as it was made out to be. Apparently, the pupils were more handicapped by the lacking mathematical acumen.

In summary, the Newman Error Analysis revealed that 59.57% of rural area pupils' errors in the English Test were due to weaknesses in content-knowledge. Similarly, in the urban pupils' case 75.47% of their errors in the English Test were caused by similar weaknesses. These two groups of learners urgently need to become better in both the said subject and in English language proficiency for their achievements to increase.

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